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Newberry, Fl

July 22, 2019

REPLY COMMENT

RE:

REPLY COMMENT TO ARRL/SIDDALL FINAL REPORT 7/15/19
https://ecfsapi.fcc.gov/file/10718632326911/July%2018%2C%202019%20Ex%20Parte%20Filing.pdf

Dear Sirs:

Unfortunately, the new PROPOSAL, filed in multiple documents:

REPLY COMMENT TO ARRL/SIDDALL FINAL REPORT 7/15/19[1]

and also in a much longer form[2] touted as "THE ONLY SOLUTION IN THESE FILINGS," reveals an illusory basis composed of spider web, works *against* rather than toward radio communications progress, ignores the quite simple answer to the proponent's "Question" in favor of a far more complicated and unworkable substitution, fails to provide the needed context to evaluation the implications of inappropriate messages detected, and ends with a grand new band plan, which unfairly treats narrow band 97.221(c) stations, for which there is no substantive documentation of any real interference issue. [3] What is missing in all of this is any factual basis beyond anecdotal events.

1. Illusory Basis for All These Demands

Huge new "solutions" to perceived problems, should in fact be based on real problems, well-documented as to incidence and severity, and for which there are no non-regulatory solutions. The new PROPOSAL fails completely. In the Table below, the two "root causes" as stated by the writers are examined.

1 https://ecfsapi.fcc.gov/file/1071863434533/FINAL%20VERSION%20Siddall%20reply%20June%2018.pdf
2 https://ecfsapi.fcc.gov/file/10718632326911/July%2018%2C%202019%20Ex%20Parte%20Filing.pdf
3 Please note that the author is not a representative of the WINLINK system or the WINLINK DEVELOPMENT TEAM, just an interested and involved amateur radio operator.

	Root cause as stated by the proponents	Response
1	"the inability to monitor all over the air content of transmissions "	As has been explained by world experts and technology pioneers who have actually brought enormous progress to Amateur Radio, there is no inability to monitor the technologically advanced communications found objectionable by the proponents. Rather, their own failure to advance the art by developing their own desired monitoring capabilities (demanded by them) is the root problem. Real-world experimental data has confirmed the statements by true experts. Phil Karn explained that **actual progress in radio communications leads to increased hurdles for eavesdroppers**. He attempted to explain that progress in modulation efficiency should be the *goal*, not the basis for *objection*. *If the rule were expanded to prohibit anything that might incidentally make monitoring harder, regardless of intent, little would escape its scope. Virtually anything one might do to facilitate communications and/or use the radio spectrum more efficiently will have the side 5 effect, intended or not, of making that communication more difficult for some third parties to monitor. Even a rare natural language could be an "effectively encrypted" communication even 6 if the speakers' intent is solely to facilitate communications (e.g., because it's their native tongue).* [4] Mr. Karn continued to explain that fact in a later communication, and noted that a chief supporter of RM-11831, T. Rappaport appeared to have conceded the point.[5] It is apparent that the writers of the PROPOSAL here discussed did not agree. Hans-Peter Helfert, an amateur radio operator himself, and the head of the software development department of SCS, explained that every one of their advanced modems includes a monitoring capability.[6] This allows on-the-air modulations to be eavesdropped at will, but obviously cannot guarantee that the monitor will be granted perfect signal to noise ratios by the ionosphere! Coincidentally on the same day that the Proponents' PROPOSAL was published, John Huggins document provided actual texts that

4 https://ecfsapi.fcc.gov/file/10422455216228/rm11831.pdf
5 https://ecfsapi.fcc.gov/file/10513525129724/rm11831-rebuttal-to-rappaport.pdf
6 https://ecfsapi.fcc.gov/file/10417301289214/SCS_FCC_Comment_RM11831.pdf

		were captured by the SCS modems using the monitoring mode, proving the statements by Mr. Helfert. Mr. Huggins attempted to explain the difference between signal capture in OSI layers 1 & 2 as compared to processing by layers up to Application layer #7.[7] In the case of WINLINK transmissions, it has been explained by multiple writers that a 30-year old public-domain, highly efficient compression system is utilized to turn the monitored data into ordinary readable text. This feat (considered miraculous by some) is completed tens of thousands of times monthly by VHF/ UHF/ and HF users of the WINLINK system, since all of their systems use basically the same processing, all of which is publicly available (through the work of John Wiseman) and utilized by multiple providers of client systems that can participate in winlink-type communications. All these other providers succeeded in developing the required software….but not the proponents of RM-11831, despite the self-proclaimed status of some s experts. Encryption, when utilized by non-amateur radio commercial users, means that even with a perfect signal to noise ratio, one cannot read the transmitted language. Proponents of RM-11831 have tended to use some form of claim of encryption therefore to deceptively enhance their argument position. This has been called out as ***false*** by Phil Karn. > ***Rappaport continues to use the inflammatory and misleading term "effectively encrypted"*** *As we all know, true encryption is and should remain prohibited on the amateur bands. For this reason, "encryption" is a loaded word among radio amateurs, and I object to Rappaport repeatedly pushing this emotional button with the misleading term "effectively encrypted".* [8] Nevertheless it persists. To answer that claim, and that of multiple public writers demanding an example demonstration that WINLINK can be eavesdropped or snooped, I carried out a successful demonstration and published it in the FCC filings[9] – only to watch it's implications be denied by intransigent supporters of RM-11831. Repeated demonstrations were then carried out[10], allowing further

7 https://www.fcc.gov/ecfs/filing/10719145238785
8 Karn, https://ecfsapi.fcc.gov/file/10513525129724/rm11831-rebuttal-to-rappaport.pdf
9 Description of first complete text eavesdropping of a WINLINK message to prove there is no encryption, https://ecfsapi.fcc.gov/file/10410170249078/FCCRM11831-4.pdf
10 Documentation of additional, including witnessed, full text eavesdroppings of WINLINK messages: https://ecfsapi.fcc.gov/file/1071540521688/FCCCommentJuly2019.pdf

		grasp of the issues involved, including one with 2 witnesses[11]; these demonstrations were then published widely. [12] [13] Despite clear explanation of the purpose and findings of that simple proof-of-concept demonstration, one of the authors of this current proposal had this to say about it: *"And despite the bogus "proof" floating around those won't decode P3, as used by Winlink, randomly over the air. You still need 100% of the packets to decompress."*[14] That comment seems to demonstrate a profound lack of understanding of the experiment itself, and the process of providing factual information to those in decision-making positions. The text in which the experiment was reported very clearly explained the limitations of the experiment and the need for 100% capture for decompression. During the time of all these discussions, a web viewer allowing perfect reading of all USA-connected radio messages passed by the WINLINK system was provided helpfully by the WINLINK Development Team,[15] which had utilized that technology for years to try to assist systems operators in vigilance.[16] In order to further explain to those who might still find need for a radio-based method of monitoring WINLINK transmissions, I provided a discussion of how a diversity receiver system (utilized at least since World War II) might improve their monitoring. Proponents of RM-11831 continued to major on the perceived difficulties, rather than understand how they had undercut that argument by touting the advantages of Forward Error Correction – which is inherent in PACTOR communications. Analogous systems could obviously be used to monitor other protocols utilized by the WINLINK system, since the data handling at the application layer is identical across protocols.. In summation, the inability for proponents of RM-11831 to fully monitor WINLINK transmissions rests squarely on their lack of technological development of systems, not on any fundamentally

11 Witness account of successful full text WINLINK eavesdropping: https://www.fcc.gov/ecfs/filing/10715183432187

12 Commercially available text documenting methods to eavesdrop on WINLINK and of the successful proof-of-concept https://www.amazon.com/Spying-WINLINK-Gordon-L-Gibby/dp/1080563199

13 Freely available PDF (for non-commercial usage) of Spying On WINLINK: https://www.qsl.net/nf4rc/2019/SpyingOnWINLINKV2.pdf

14 https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-22#post-5137149

15 USA message viewer: https://winlink.org/content/us_amateur_radio_message_viewer

16 System Operator Message Viewer: https://winlink.org/content/sysops_message_monitor

		insurmountable difficulty. Years ago, at least one self-proclaimed expert with all the resources necessary, claimed this was a matter of national security[17]….but I am not aware of efforts by the expert to create the necessary technological development.
2	"interference from ACDS operations "	Proponents only explanation for any interference has focused on stations operating outside the narrow ACDS slivers, by virtue of 97.221(c). Their claims of this interference were dramatic, but based only on anecdote. A lengthy study of actual data of United States WINLINK 97.221(c) stations demonstrated conclusively that the maximum possible interference – even if EVERY transmission was considered an interference – was down around 1/100 of 1%. [18] Proponents have never made any fact-based correction or objection to the data developed in that study, but have instead actually relied on it, implicitly agreeing with the data (but unwilling to formally acknowledge the failure of their claim). The study was released in FCC filings on April 9, 2019. Proponents' new PROPOSAL was released on June 18th 2019. That interval provided the proponents with **more than 60 days' time to complete actual studies to show the existence of actual "interference" and even gave them an example of a way to analyze interference** – but proponents made no known attempt whatsoever to document any real problem incidence. Without a proof of a substantive real problem, this claim is illusory, and should be discounted.

Thus, the supposed "problems" are either non-existent, or could have been solved by the proponents, had they deemed them to be true problems worthy of their attention.

17 "I pointed out national security concerns with the current problem of encrypted data, which arises from the non published compression algorithms used in Pactor II, Pactor III, and Pactor IV, and also discussed how the identification of many ACDS stations are often encrypted, as well, since that is an option on the SCS modems." from: https://ecfsapi.fcc.gov/file/1110241203910/Reply%20to%20Comments%20NPRM.docx

18 https://ecfsapi.fcc.gov/file/10408063816674/FCCRM11831-2.pdf

2. Technological Confusion of Well-Acknowledged Communications Models

The proponents of the current new regulations and band-plan appear to have a complete misunderstanding of the difference between re-constructing a proprietary hardware-based modem in a PC-based alternative (a challenge at the OSI Layer 2[19]), versus using off-the shelf systems to accomplish the monitoring (decompressing at the OSI Layer 7, exactly as WINLINK) which they claim to so fervently desire.

Here they refer confusingly to comments from SCS of how difficult the former (Layer 2, 3 devices) is:

> *"In this comment, Helfert says it "requires considerable effort" for even someone possessing the source code (undisclosed code) and "expensive", not so easy anyone could devise an inexpensive method.*
>
> > ***'QUOTED FROM HELFERT COMMENTS IN RM-11831:***
> > *Nevertheless, SCS is willing to develop and provide a free PACTOR monitoring tool as a contribution to "mutual understanding" in the spirit of AR. This would be a software solution under the operating systems Linux and / or Windows. The tool would not require any special hardware. However, such a development would require considerable effort for SCS, as our modems are powered by specialized signal processors. Porting the software to common Intel and ARM processors will be correspondingly expensive. Nonetheless, we are willing to provide such a comprehensive, free monitoring tool. It would integrate with the Volunteer Monitor Program now being organized by the ARRL.*
> > *We propose the following be adopted as requirements for a (new) digital method:*
> > *1. Description of its fundamental characteristics (ITU emission designator)*
> > *2. Description of the channel and source coding*
> > *3. Availability of an easily accessible monitoring mode*
> > *We see this as more than adequate for the required "transparency" '*
>
> • *" Finally, after five years of contentious comments, we have an admission from the SCS Design Engineer that Over the Air display of ALL the content requires an "expensive" solution that 'requires considerable effort for SCS; ".*[20]

But then draw a fallacious apples to oranges *false contrast* with an experimental proof carefully detailed as dealing only with the Application Layer 7, carried out as part of disproving their claim of encryption:

> *"Recent claims to have accomplished this appear to conflict with Helfert's "expert" testimony, as the actual Design Engineer of the SCS Pactor Dragon modem. https://ecfsapi.fcc.gov/file/1071540521688/FCCCommentJuly2019.pdf "*[21]

19 https://www.webopedia.com/quick_ref/OSI_Layers.asp

20 Quoted from the initial portion of "**D. NEED FOR AN ACCESSIBLE, WORKING OVER THE AIR MONITORING METHOD"**

It is as if the proponents did not distinguish between the various levels of the OSI 7-layer model.

3. Profound misunderstanding of WINLINK operation & protections, FCC assignments of responsibility

Next, the proponents move to one of their favorite targets, the communications possible in the WINLINK system, in use for decades. Here their **profound misunderstanding of the system** leads to so many false issues that it is difficult to address all of them. I'll work on this important claim:

> *2. Access to the internet port (incoming messages) by unlicensed individuals who have no knowledge of Part 97 or third party treaties, making UNLICENSED PEOPLE THE DE FACTO CONTROL OPERATOR. The first RMS operator should be required to take these incoming messages from a buffer file, and SCREEN THEM before transmission over RF.*[22]

Indeed there *can* be issues with unlicensed persons contacting licensed amateur radio operators by way of the WINLINK system[23], but the proponents seem oblivious to the protections built into this system precisely because of that, and also either unaware of, or in complete disagreement with standard ARRL teaching on this point, which has been in print for at least 6 years.

The WINLINK system provides a safeguard to prevent unwanted individuals from succeeding at sending messages through it via the Internet[24], the WHITE-LIST system.[25] Each operator is able to "vet" the people who are allowed to send them emails [thus accessing the WINLINK system] through their WHITE-LIST. **The default is NO internet-based persons (without an account) are able to access the system**. Each user must explicitly take action in order to allow a correspondent to access it. The email user can then only reach the single person who has vetted them. For example, an amateur needing to be certain that their State EOC were able to reach them in a deployed position, can explicitly enable the email address of their State EOC to be able to send to them.

The proponents seem completely unaware that the **deployed individual has a choice of a vast number of RMS stations ("servers") from which to retrieve any such communication** from their State EOC. When the State EOC emergency manager initiates an email to the deployed amateur radio operator, there is zero knowledge of which RMS will later be utilized for that message to be retrieved. However, it cannot be sent over the radio unless the deployed amateur has previously approved that (possibly unlicensed) State EOC email address; and the radio communication does not occur at the time the vetted individual write the email, but at the time the radio amateur retrieves the message. Furthermore, WINLINK users have the option to SEE a list of their pending email and reject those

21 Quoted just a few lines further down in "**D NEED FOR AN ACCESSIBLE, WORKING OVER THE AIR MONITORING METHOD"**

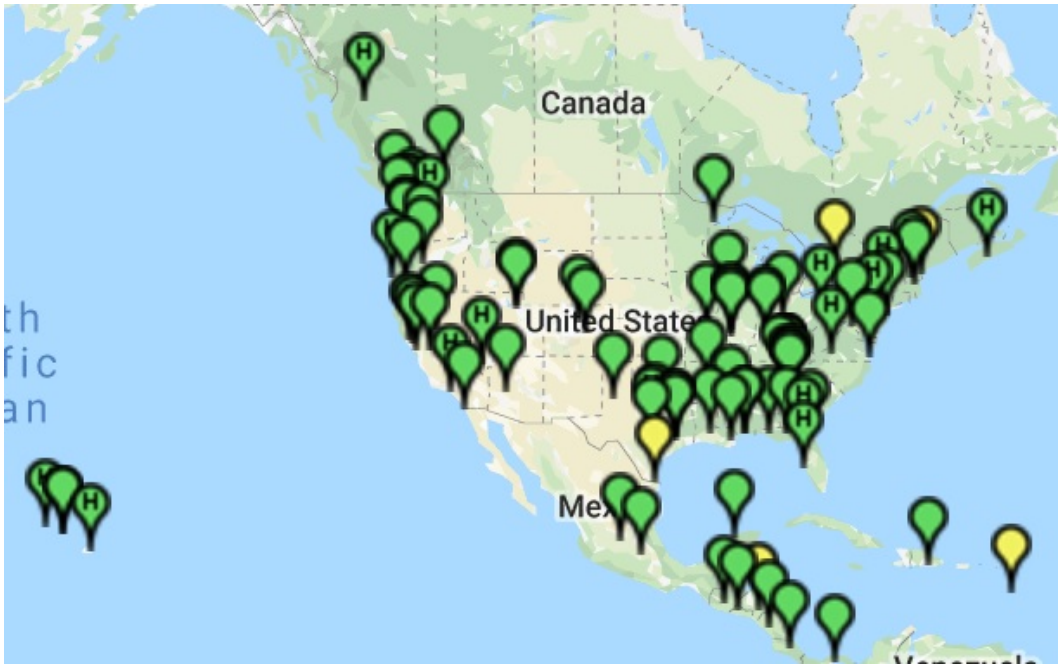
22 Section **D. WINLINK COMPLIANCE WITH CONTROL OPERATOR RULES**

23 Just as anyone can purchase an amateur transceiver and begin communications; the equipment does not prevent it.

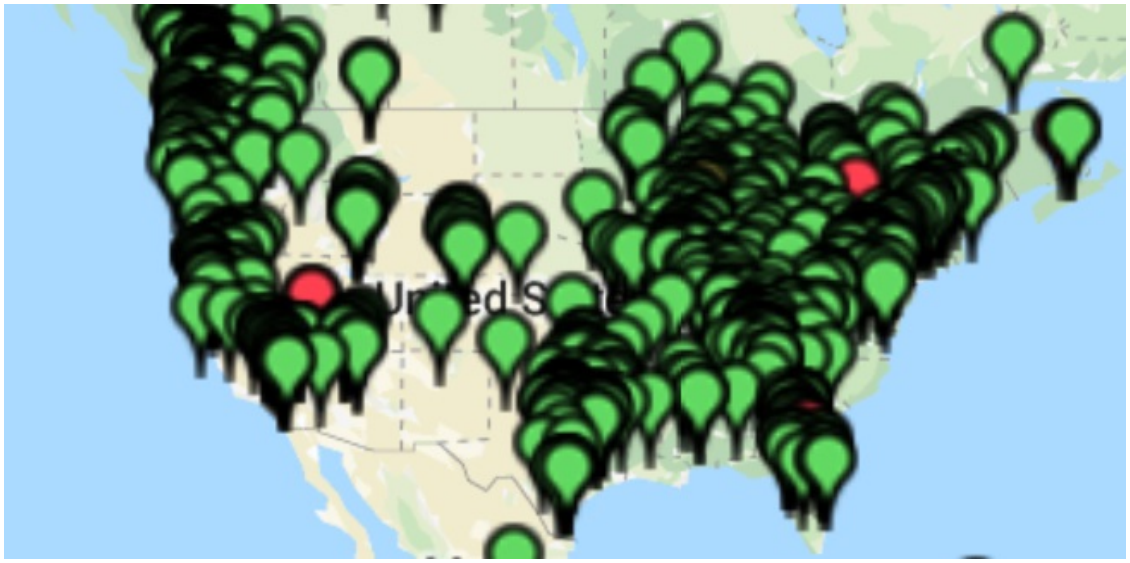
24 Other protections are used to prevent unlicensed persons from acquiring an authorized account.

25 https://www.winlink.org/content/how_manage_your_whitelist_spamcontrol

which are not welcome. Thus a very reasonable protection has existed within the WINLINK system for years.



Potential northern hemisphere RMS ARDOP server stations that could be utilized depending on the situation.



Potential VHF/UHF Winlink servers that could be utilized, depending on the situation.

In their Proposal, the proponents attempt to claim that the unlicensed State EOC emergency manager has become the "DEFACTO CONTROL OPERATOR"….a fascinating conclusion, since when the EOC manager sent their email, he/she had **no idea which RMS would be utilized to deliver it**….and how can you be the CONTROL OPERATOR of a station when you had no knowledge of even

- which station,
- what time, and
- what frequency,

you would be controlling? This is an interesting conclusion, arrived at by the new proposal writers.

Far more correct and consistent is the training provided in standard ARRL Extra Class License Manuals, at least in the 10th Edition and 11th Edition texts, which I possess. From page 3-10 in both editions, one can learn

> *"It's important to be aware of the rules for remote control because more and more radio equipment is designed to support remote control. A popular example of stations under remote control are the digital Winlink RMS PACTOR stations (www.winlink.org) that wait for a station to call them before responding. The RMS station is considered to be remotely controlled by the calling operator."*[26]

So the actual CONTROL OPERATOR is (in this example) the deployed amateur radio operator who makes the decision

- which band,
- time,
- frequency and
- mode to use,

on his/her radio to make a connection, to a specific RMS station of his/her choosing, and then downloads [exerting remote control] the message originated by the State EOC emergency manager, **for whom the actual CONTROL OPERATOR made explicit provision for that message from that individual to even pass, and only to themselves.**[27] There is no unlicensed "port" over which un-vetted non licensed persons is able to communicate. (And as this is being written, new protections are being instituted by the WINLINK DEVELOPMENT TEAM to deal with errors of 3rd party agreement information made by WINLINK users.). I found this same lack of understanding of this issue in a prominent national forum and attempted to correct the misunderstanding. [28] [29] [30] [31] The questioner in that discussion (one of the authors of the referenced filing) never

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26 The American Radio Relay League, Extra Class License Manual, 10th Ed., c. 2012, p 3-10, and The American Radio Relay League, Extra Class License Manual, 11th Ed., c. 2016-2017, p 3-10.

27 Thus they are explicitly controlling whether the 3rd party is allowed communications. There is no requirement in Part 97 that the amateur "preview" what is spoken by a 3rd party on their microphone. However, in the voice 3rd party instance, it is true that the amateur can cut them off, whereas the email once started, cannot be read until fully received.

28 Read an assertion that dramatically disagrees with ARRL teaching: https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-6#post-5133590

29 https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-10#post-5133784

30 Information about ARRL teaching: https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-11#post-5134278

31 Concluding ARRL explanation: https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-12#post-5134292

indicated new-found agreement with the ARRL teaching and their (alternative) view of the FCC regulations is reflected in their Proposal.

The filers then provide their "obvious solution" and a question presumably to stump the reader. An understanding of how the actual WINLINK system works, as described above, should help anyone understand the fallacy of the proposed "OBVIOUS SOLUTION:"

> ***"OBVIOUS SOLUTION****: Require in Part 97, and enforce the practice, that any email originating from the internet (from unlicensed users) is to be placed first in a BUFFER FILE which must be reviewed by a "vigilant control operator"* ***BEFORE TRANSMISSION*** *over the Winlink RF system. My question to the Enforcement Bureau is this: If you were to send a warning letter to a control operator,* ***WHO WOULD YOU SEND IT TO****?"*[32]

Understanding how the actual WINLINK system works, and what is standard Extra Class License manual teaching, explains not only who is the control operator, but also the obvious person to contact if there is a problem with a third-party's communications --- the amateur radio operator who not only allowed that person to send them messages, but also make the contact that allowed passage of the message, and initiated the transmission. Pretty simple.

4. Total Lack Of Context to Inappropriate Messages

The new proposal writers certainly compiled a long list (at least 28 messages) of messages that likely should not have moved across amateur radio! This comes apparently from a larger list of 150+ pages of other emails they judged as objectionable.[33] However, what is once again missing in this list of anecdotal information is any context, the denominator of the list of messages from which it was drawn – the "sample size" studied. With a large and complex amateur radio population, there will be inappropriate messages always moving through voice, cw and digital traffic. One only has to listen to certain SSB voice frequencies, I'm told, to understand this. Therefore a presentation of a list of inappropriate messages by itself gives us a very incomplete picture. The WINLINK system may move fifty thousands messages in a month's time. Were the 28 presented messages drawn from 5,000, or from 50,000, or from 5 million messages? If violations are occurring at a rate of 10%, this is certainly an issue – whereas if they are occurring at a rate of 1/100 of 1%…..it is a quite different story. Do the proponents of RM-11831 agree with that principle?

I attempted to explain this to some writers of the Proposal, and asked for information on the denominator of the presented sample, but met with no success so far. [34] That despite requests from one of the writers for discussion, apparently on these matters. Unable to get any more information from the writers of this latest Proposal, I have asked for help from the Enforcement Bureau, which has

32 Concluding paragraph of **D. WINLINK COMPLIANCE WITH CONTROL OPERATOR RULES in the referenced new Proposal.**

33 https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-15#post-5134955

34 https://forums.qrz.com/index.php?threads/arrl-report-no-consensus-reached-for-fcc-on-%E2%80%9Csymbol-rate%E2%80%9D-issues.666183/page-19#post-5136042

given me a "ticket" #3407136. I'm simply trying to learn the number of emails considered objectionable, and then an indication of the size of the pool examined to find them – over HF it appears that right at 840 messages were transferred per day in the month of June 2019.[35] .

5. The Proposed Band Plan

I don't consider myself any expert on international frequency allocations, so I have more limited comments on the proposed reallocation of amateur radio frequencies.

- While I do believe the expansion of the US 80-meter phone segment does not match the interests and amazing growth of NVIS digital communications, and therefore I'm encouraged by the band plan's increase in 80-meter ACDS segments, I would recommend an analysis of current utilization of 3600-3625 kHz before any changes are made.

- The 30 meter band is quite useful for digital communications, where the average WINLINK operator is using 100 watts output or less due to tight limits on latency of transmit-receive switching, but the RTTY or CW operator can use far greater powers on most bands – thus making 30 meters a very useful choice for digital communications in emergencies. Removing that portion from ACDS usage is unfortunate.

- Likewise the 18 MHz allocation figured prominently in Puerto Rico communications, so eliminating that is also unfortunate.

6. Misguided 97.221(c) animus

The arguments against placing narrower-bandwidth systems in the same segments as wider-bandwidth systems make considerable sense. Restricting JS-8 auto-operators (50 Hz bandwidth) to the ACDS segments were 2.4kHz signals are common, is very unfortunate for that new ham-developed application. The writers of the new Proposal have concern for narrow band systems of only certain types, based on their choices.

Although the narrow-band WINMOR, ARDOP and Pactor II WINLINK stations contribute very negligible current usage of CW / RTTY frequencies (as shown in a documented analysis, and contrary to repeated assertions from proponents of RM-11831) – they provide a very useful "overflow" during disasters when the narrow ACDS segments might be overwhelmed. The current proposal erases that overflow possibility.

Respectfully,

Gordon L. Gibby MD KX4Z

35 https://winlink.org/RMSChannels ; click on the "Traffic" tab for data.